

Rio Grande Citizens' Forum
February 7, 2007
USIBWC Headquarters
El Paso, TX

***Tentative Meeting Notes**

Ken Rakestraw called the meeting to order. The Board Members introduced themselves. Mr. Rakestraw acknowledged the other board members who were not in attendance. He asked the members of the audience to introduce themselves.

Board Members in Attendance

Joe Groff, Chihuahuan Desert Wildlife Rescue
Zay Clopton, New Mexico rancher
Irene Tejeda, Paso del Norte Water Task Force
John Hernandez, Elephant Butte Irrigation District
Alisa Jorgensen, Save the Valley
Ed Fierro, El Paso Water Utilities

USIBWC staff in attendance

Ken Rakestraw
Sally Spener
Tony Solo
Hayley Goodstein
Richard Peace

Mexican Section staff in attendance

Ramiro Lujan
Enrique Muñoz

Members of the Public in Attendance

Mary Sanchez, NRCS Las Cruces
Carlos Rincon, EPA
Sam Irrinki, CH2M HILL
Hilary Brinegar, NMDA
Amy Sue Alesch, Ysleta del Sur Pueblo
Maria Trunk, Frontera Land Alliance, Friends of Rio Bosque
Inga Groff, League of Women Voters of El Paso
Fred Phillips, New Mexico Tech
Kevin vonFinger, Frontera Land Alliance
Mike Landis, U.S. Bureau of Reclamation
Woody Irving, U.S. Bureau of Reclamation
Chris Canavar, NMED
Mr. And Mrs. I.M. Pyan, Lower Valley farmers
Nancy Clopton
Alfredo Martinez, UTEP student
Pat Carlson
Ari Michelsen, Texas A & M University, TAES

Natural Sources of Saline Water in the Rio Grande

Fred M. Phillips, Professor of Hydrology, New Mexico Tech, gave a presentation on this topic. The research was funded by the Center for Sustainability of semi-Arid Hydrology and Riparian Areas (SAHRA) and the National Science Foundation. The study covers the Rio Grande from the headwaters to Ft. Quitman, Texas. He showed a graph from 2000 and 2001 showing increasing salinity as the river moves downstream, increasing from about 200 mg/l TDS to over 2500. During the summer, salinity is diluted with discharge from Elephant Butte Dam.

He described various salinity sources including cyclic salts and wastewater. Other factors are things that evaporate the water and leave salts behind, such as agricultural evapotranspiration. Subsurface sources such as geothermal waters (mostly in the lower part and on the Jemez River) and saline groundwater were also noted.

He cited various experts and studies over the years who attributed increasing salinity to various factors including use and re-use of waters for irrigation, displacement of salty groundwater in the course of irrigation and drainage (irrigation flushes the salt out of the groundwater), and continental solute erosion.

The study looked at the chloride/bromide relationship to determine sources which were: meteoric (precipitation), geothermal waters, and sedimentary brines. The study also looked at the chloride 36/bromide relationship. He explained that if evaporation were the main source, you wouldn't expect the ratio to change. But if there are other waters mixing, then you would see the ratio change. Based on the tracer work, it appears that there is mixing with sedimentary fluids, ancient salts from when the rocks were deposited. So the study concludes that a large part of Rio Grande salinization is due to seepage of deep, sedimentary-origin brines.

The study also attempted to determine the source of the brines. Some salinity increase is due to inputs from the Albuquerque wastewater treatment plant then it spikes again at San Acacia, Elephant Butte, Selden Canyon, and El Paso. The spikes suggest that salts are coming in at these other points. The researchers then looked at these sites compared to the structure of the Rio Grande Rift, a natural geological formation. He correlated the sites of salinity spikes with the downstream ends of different basins that make up the Rio Grande Rift. He stated that hydraulics force the salts out at the end of the basin. The researchers identified a pool at San Acacia where salts are seeping to the surface, a pond with very high salinity. At the southern end of the Mesilla Basin at El Paso, TX-Cd. Juarez, a well was drilled with very high salinity and a high chloride/bromide ratio characteristic of sedimentary brines. So the sites of brine leakage are controlled by geological formations.

The study also examined how salinity responded to drought. He presented data from 2001-2004 showing drought and non-drought years. The data indicate that salt concentration increase during drought years; salinity appears to be quite sensitive in terms of drought.

His team used a model to estimate of how much salt is coming in from different sources. The tributaries that add salt are the Rio Salado, Puerco, and Jemez. Other contributors are wastewater discharges (Albuquerque and El Paso are the main ones). Deep brine is also a significant contributor.

The take home message is – the deep brines plus the tributary inflows account for 2/3 of the salinity increase downstream to El Paso.

He also considered whether modern practices are responsible for worsening water quality. He compared historical and more contemporary data. Older data show chloride levels that are similar to or higher than the modern data.

The study conclusions are that 2/3 of chloride in the Rio Grande is due to geological salt, either from brine leakage or tributaries. Brine leakage is along structural features (mostly faults) and might be intercepted and pumped. Historical data show that brine leakage predated development of the river and may have actually decreased over the 20th century.

Agriculture contributes to salinization but probably plays only a secondary role.

Alisa Jorgensen asked about the reliability of the testing data from the earlier periods. Dr. Phillips stated that it was good data.

Kevin vonFinger asked about the kind of planning or management foreseen for drought years. Dr. Phillips stated that this is unclear since the causes are complex. Part of the increase is due to lack of dilution. So there is probably additional salt coming into the river. Some farmers may have high salinity deep wells and they turn on the pumps when they are not getting irrigation water from the river. Farmers will pump from shallow groundwater, which recycles on the fields so what eventually gets to the drains is more concentrated than when they have more irrigation water to apply. Less dilution, deeper pumping, recycling, and less water applied causes the water table to go down, which may allow additional deep salts to flow out more.

Zay Clopton commented that if it's coming in below where the freshwater is, it seems that you would get saltwater intrusion in the aquifer. Dr. Phillips responded that it doesn't have much chance to spread out and intrude the aquifers since it is following the geologic formations. If the faults are right at the southern end of the basin, it's like piping it into the rivers.

John Hernandez asked whether the well near El Paso is an artesian well. Dr. Phillips replied that he is not sure; the well is not very deep. He also asked whether a project could be developed to control the salinity entering the Rio Grande at various points. Dr. Phillips noted that it is theoretically possible for a control project at El Paso and probably San Acacia. However, it would be difficult at Selden Canyon and Elephant Butte.

Ed Fierro asked about the concept of lining the river to prevent saline intrusion into the river. Dr. Phillips is dubious about this approach because the saline water would likely emerge elsewhere. Interception of the brine is possible but sealing it is probably not.

Ken Rakestraw asked whether the chemical composition that was noted is typical of seawater or rock formation. Dr. Phillips stated that the reason the ratio is high in sedimentary brines is due to organic matter.

John Hernandez suggested that it would be more cost effective to desalt the water.

Mike Landis observed that the data from the modern period covered a very wet period.

Ed Fierro asked whether the geologic brine could be put into a pipe. Dr. Phillips indicated that theoretically it could be put in a pipe, the water would not be put back into the river, and then it could be desalinated.

Dr. Phillips also clarified that the salinity associated with the Albuquerque wastewater treatment plant effluent is probably due to higher TDS of the groundwater, which is the potable water supply for that area.

Rio Grande Maintenance Activities

Tony Solo, Upper Rio Grande Projects Manager, USIBWC, gave a presentation on this topic.

He gave an overview of the project area, including the Rio Grande Canalization Project, which covers the area from Percha Dam, NM to American Dam at El Paso, and the Rio Grande Rectification Project, which covers the area from American Dam to Little Box Canyon south of Ft. Quitman. Overall the project is 190 miles long. We have 223 miles of levee that we maintain. We also have 10,500 acres of floodway that we maintain.

We maintain five sediment control dams in New Mexico.

For the Rio Grande Canalization Project, in 2004 we identified river reaches that required maintenance. In 2005 we received a permit from the U.S. Army Corps of Engineers to perform work in the river. We started the work in 2005.

We undertake these maintenance activities in order to maintain efficient water deliveries to the irrigation districts, the City of El Paso, and Mexico. We also do it to improve operation of diversion dams and for flood control. Channel maintenance activities include bank stabilization (placement of riprap), arroyo sediment removal, arroyo realignment at the confluence with the river, and river channel sediment removal, especially in the areas upstream of Mesilla and American Dams. He discussed work being done during the current non-irrigation season at the following sites:

American Dam - In 2005 we removed 40,000 cubic yards of material. This year we have already removed 20,000 cubic yards and expect to remove 30,000 cubic yards. He showed photos of American Dam where a deep sediment island has been removed.

Trujillo Arroyo - We took sediment from one side of the river and put it on the other. We also conducted bank stabilization work. We realigned it and cleaned it up. We curved the mouth of the arroyo to run parallel to the river so as not to impact the opposite bank of the river.

Hershey Arroyo - The river channel is moving toward the levee. If this continues, this could negatively impact the levee so we made the channel straight again.

Thurman Arroyo - The distance between the river and levee is about 20 feet. If we permit this to continue, we are not going to have a levee in a few years. So we realigned it.

Placitas Arroyo – This was the arroyo in Hatch that created problems during the 2006 storm. We have ensured wide access to the river and worked upstream into the arroyo to make it wide and flat.

We work during the non-irrigation season.

Rio Grande Rectification Project – The purpose of the project is flood protection and to stabilize the international boundary. The existing channel conditions exhibit a lot of sediment and

vegetation obstructing flow. This restricts stormwater drainage into the river, reducing the flood control capacity of the project. He showed a photo of erosion up to four feet deep in the floodway.

Chamizal Project – 190,000 cubic yards of soil needs to be removed from the Chamizal area; it is 8-9 feet deep in some spots. We did some work two years ago. In the Chamizal Project, the City of El Paso has removed approximately 30,000 cubic yards to clear their drains.

American Canal – The canal was built in the 1930s; it's in sad shape in some areas. Sixteen panels have been dislodged at three locations, with erosion occurring under the panels. We started work on repairs this week. We removed water from the canal and put it in the river. Hope to complete the repairs in a few weeks. El Paso County Water Improvement District #1 is assisting with the work.

Ed Fierro asked about the disposition of the sediment that is removed. Mr. Solo stated that it is being placed in voids behind the brick factory.

Kevn vonFinger asked how the USIBWC determines how much sediment to remove. Mr. Solo stated that project supervisors are very familiar with the movements of the river. It's obvious after a storm, especially at the arroyos.

Ari Michelsen asked about the work that has been done versus the work that would be covered by the Environmental Impact Statement (EIS). Mr. Solo stated that the work is independent from the EIS in that the USIBWC obtained a five-year permit from the U.S. Army Corps of Engineers independent of the EIS.

Public Comment

Kevin vonFinger stated that he has previously suggested that minutes and presentations from the meetings be made available. Sally Spener responded that the minutes and presentations are posted on the agency web page.

Several people expressed their appreciation to Dr. Phillips for traveling to El Paso to give the presentation on Rio Grande salinity.

There was no additional public comment.

Board Discussion

There was no additional board discussion.

Suggested Future Agenda Items

Ed Fierro requested a list of topics that have previously been covered by the Citizens' Forum.

Ken Rakestraw stated that Wayne Treers of the U.S. Bureau of Reclamation typically does a presentation once a year for the Citizens' Forum regarding Rio Grande Project conditions and operating plans for the year. He recommends that this be scheduled for the May meeting.

Sally Spener stated that some environmental groups and the Elephant Butte Irrigation District have been working on cooperative efforts related to the Rio Grande Canalization Project. They have requested to be placed on the agenda for the May meeting.

John Hernandez proposed that at the upcoming meetings in August or November there be a discussion of hydrology during a period of climate change.

Carlos Rincon suggested that information be provided regarding the FY 2007 and FY 2008 budgets and projects that the board might be interested in seeing for the FY 2008 budget. He suggested that there might also be interest in receiving budget information for other related agencies such as the State Department, Department of the Interior, U.S. Bureau of Reclamation, and U.S. Department of Agriculture.

Woody Irving proposed a summary of what various agencies are doing as a result of the last flood season.

Ari Michelsen stated that he has been working with Congressman Reyes on a post-flood assessment of conditions. There was a meeting of 11 federal agencies and irrigation districts in September to discuss this. He also mentioned that the Transboundary Aquifer Assessment Act, a piece of federal legislation, passed last fall to assess aquifers on the border. We are working to see about getting that funded. The water resources research institutes are working on it. The authorization is for \$5 million per year to USGS and state water resources institutes in the affected states.

Richard Peace suggested that border security might be of interest.

The next meeting will be held May 2 in the Las Cruces area.

The meeting adjourned.

*Meeting notes are tentative and summarize in draft the contents and discussion of Citizens' Forum Meetings. While these notes are intended to provide a general overview of Citizens' Forum Meetings, they may not necessarily be accurate or complete, and may not be representative of USIBWC policy or positions.